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ABSTRACT

This study investigated incidental learning in middle and lower class black and white preschool children. The study questioned whether (a) preschool children acquire learning incidentally; (b) there was a difference in the quantity of such learning between black and white children; (c) differences in learning was influenced by socioeconomic status; and (d) differences were as evident for familiar as compared with unfamiliar stimulus materials. The experiment used a measure of incidental learning obtained by exposing subjects to a room containing selected items but giving them no instructions to attend to the objects. A comparison group was also placed in the same room but instructed to attend to the objects. The second dimension of familiarity was added by including items in the room which were known to the children as well as objects likely to be unfamiliar. Following a fixed exposure of three minutes, each child was given a free recall and recognition test. The findings verify the presence of incidental learning in preschool children. Black youngsters did substantially better than their white counterparts on the recall of familiar objects. White preschool children did substantially better than their black counterparts on the recognition of unfamiliar objects in the incidental learning condition. (Author)

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THE PRESCHOOLER: SOCIOECONOMIC STATUS, RACE, AND INCIDENTAL LEARNING

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PS 005763

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ABSTRACT

This study investigated incidental learning in middle and lower class black and white preschool children. The study questioned whether (a) preschool children acquire learning incidentally; (b) there was a difference in the quantity of such learning between black and white children; (c) differences in learning was influenced by socioeconomic status; (d) differences were as evident for familiar as compared with unfamiliar stimulus materials. The experiment used a measure of incidental learning obtained by exposing subjects to a room containing selected items but giving them no instructions to attend to the objects. A comparison group was also placed in the same room but instructed to attend to the objects. The second dimension of familiarity was added by including items in the room which were known to the children as well as objects likely to be unfamiliar. Following a fixed exposure of three minutes, each child was given a free recall and recognition test. The findings verify the presence of incidental learning in preschool children. Black youngsters did substantially better than their white counterparts on the recall of familiar objects. White preschool children did substantially better than their black counterparts on the recognition of unfamiliar objects in the incidental learning condition.

INTRODUCTION

Every item present in a classroom represents a potential source of learning for students independent of any formal or direct instruction. Therefore, even though the teacher does not bring many of these stimuli to the attention of students, the stimuli may facilitate learning. Any knowledge gained from such stimuli is quite coincidental and aptly called "incidental learning" (INC). The phenomena has been described as learning which occurs in the absence of an overt set to learn since no instructions are suggested or implied. Formal learning is, nonetheless, influenced by implicit cues given to the learner as well as sets which the individual brings to a novel situation as a function of his past experiences.

At a time when "early intervention" for "disadvantaged" children has been the concern of educators, government, and private citizens alike, it is pertinent to investigate variables which appear to be helpful in advancing the "readiness" of such children for gains provided through conventional school experiences. The existence and understanding of INC may be utilized by the curriculum builders by providing selected learning material in the classroom to which children are exposed during directed learning experiences as well as play situations.

It is clear that many early intervention programs (in which the strategy seems a most viable tool) include lower class and minority group children, a majority of whom are often black. The degree to which these children from lower socioeconomic levels may profit from use of incidental learning strategies as well as stimuli capable of providing INC learning should be of specific importance.

While the phenomena of INC learning has been of theoretical interest since the 1930's, a cursory summary of previous research reveals that INC as a function of race and social class has received only minimal attention.

Wilson (1958) found no significant positive relationship between socioeconomic status and incidental learning among educable mentally retarded and normal adolescents. Brown (1968) found white normal nine to fourteen year old boys systematically lower than Negro normals and the retarded groups on learning and retention of meaningful material under both incidental and intentional learning conditions. No significant differences were found among the normal and retarded groups on the learning and retention of non-meaningful material. Incidental learning was systematically inferior to intentional learning on meaningful and non-meaningful material by both normal and retarded groups. In a pilot study of concept attainment and incidental social learning, Colton (1970) demonstrated that although gains were made in attaining some concepts, there was no pre - post change in the choices of "preferred companions" by integrated or all white kindergarten children as a result of viewing either unknown, same, or opposite color children portraying "teachers" in videotaped sequences. Naylor (1971) investigated the differences in learning behavior of disadvantaged Mexican American and Anglo American first graders and failed to support his hypothesis that learning style (i.e., information demand, field dependence-independence, and originality) differences existed though an impulsivity-reflectivity measure showed the Anglo American children made more errors.

Fewer studies are available in which the performance of

preschool children on this phenomena is stated. Wilson (1958) concluded that in his preschool children performance on imitative responses in an appropriate set in the absence of a model was essentially that of learning an incidental cue. Mussen (1965) found preschool girls of nurturant mothers showed more incidental imitative learning and Ross (1966) showed a positive relationship between dependency and incidental learning possibly due to the value of high achievement placed by parents of low dependent children.

OPERATIONAL CONCEPTS

Two basic types of INC learning conditions may be distinguished. In Type I the subject is exposed to the stimulus materials but given no instruction to learn. His retention is then tested unexpectedly folowing the exposure. Such retention may be tested by recognition, free recall, or transfer to a new task. Choice of the test is determined by the criteria of INC learning in the experiment. Criteria is based on kind and amount of learning required for successful performance.

In a second approach to INC learning, subjects are given a specific task to be learned but during instruction is exposed to information or cues which are not a part of the instructions. His retention for the latter features of the situation define the amount of INC learning he has acquired and the measure obtained will again be a function of the test. This second (Type II) situation may be further subdivided into two classes on the basis of the relationship between the relevant and irrelevant components of the total learning situation. The irrelevant component may be features or attributes of the materials which the subject has been instructed

to learn but which are irrelevant in the sense that their discrimination and retention are not required. For example, if verbal items which the subject has been instructed to learn are printed in different colors, the colors are a feature of the learning material which is irrelevant to the explicit task but essential to INC. On the other hand, the irrelevant components may be materials or cues which bear no direct relationship to the learning task, e.g., when the instructions are to learn a series of words but such additional items as digits or geometric forms are exposed along with the words. Thus, the two classes are distinguished within the Type II situation and refer respectively to the incidental learning of intrinsic and extrinsic components of the experimenter defined task.

OBJECTIVES

The questions being asked in the investigation were:

(1) Do preschool children acquire learning incidentally?

(2) Is there a difference in the quantity of such learning between a group of black as compared with a group of white children?

(3) Does such a difference between these groups also differ according to the children's socioeconomic status?

(4) Are there manifest differences in incidental learning of familiar versus unfamiliar stimulus materials?

PS 005763

METHODOLOGY

A single experiment of the Type I design discussed in the an earlier section of the paper was conducted. Difficulty in designing tasks suitable for the Type II design for the preschool level was found in a previous experiment conducted by the authors.

Population and Sample

Subjects were identified as being black/white and lower/middle socioeconomic (SES) levels respectively. The latter were determined using parents' occupation. An expected family income of less than $5,000 per year identified a child as being from the lower SES level. Children with parents whose occupations were representative of an income of $6,000 per year or higher were considered as middle SES. Children whose parents were welfare recipients were automatically classified as coming from the lower SES levels, while children whose parents were then enrolled as graduate students at the university were considered middle SES.

The ages of the children fell within a range of three to four and one-half years (preschool level). All children were selected from the Friendship Day Care Center, Lansing, and the Eastminster Day Care Center, East Lansing, Michigan.

Data and Instrumentation

As previously noted, subjects were divided into an experimental (INC) and control (INT) group.

Experimental Group (INC Learning). A small and otherwise empty room was used. Sixteen pretested stimulus items were then placed in the room. Eight items were classified as "familiar" to subjects while the remaining items were "unfamiliar" to the children. The authors felt that it would be of interest to note whether this selection of familiar/unfamiliar items might give some inkling of whether utilization of an INC strategy is in any way related to past experience as that provided by the home environment, for example. Care was taken, however, to achieve a "normalized" (not overcrowded)

effect in the room. (See the Appendix for items used in the study).

Each child in this group was placed alone in the room with instructions as follows: "I want you to wait here for me for a few minutes. As soon as I find what I'm looking for, we could play a little game together". Each child stayed alone for a three minute period. He was then taken to another nearby room and told: "Before we play our little game, I want you to tell me all the things you saw in the room where you were waiting for me". This instruction represents the unexpected free recall test. A maximum of five minutes was used for this part of the examination.

Directly following the free recall test, the child was told, "Okay, suppose we play a little game. I will show you some pictures. You show me which one of the pictures is the same as something you saw or saw a picture of in the room where you were when you were waiting for me". For each item in the room a set of four pictures (including a picture of the item) was presented on a single sheet. Each child was given a maximum of one minute to make the appropriate selection and had a single chance to identify each correct response. Where a child responded a second time and in quick succession he was given a second trial after restatement of the question in order to decrease the possibility of correct responses through guessing. As each set of pictures is presented, the experimenter would say, "Show me which of these you saw".

Each child was scored one (1) for each item recalled and zero (0) for those not recalled during the five minute period. (A longer time period was allowed only if the child appeared to be attempting to recall something but having difficulty doing so. Descriptions of an item to the experimenter's satisfaction was

considered acceptable. It was expected that the experimenter could recognize when the child had completed his maximum recall.

Four scores of INC learning derived from this "no instruction" condition were computed for each child who took part in the experiment. There was a recall score as well as a recognition score for both the familiar as well as unfamiliar objects.

Control Group (INT Learning). To establish that INC learning is in fact different from INT learning, the second group of children were tested in the following manner. In the second condition each child was asked to sit in the same room. These subjects, however, were instructed as follows, "I want you to wait here for a few minutes. We will play a little game. You are to try to notice and remember everything that is in this room. When I come back, we will leave here and I will ask you to tell me all you saw in this room while you were waiting".

Each child was allowed to wait for a three minute period after which he was taken to another room and tested in the same manner as the first group of children. He was first asked to recall the items in the room and then asked to recognize from among pictures of a group including the item itself, the one present in the room. In a manner similar to the experimental (INC) group, each child in the control (INT) group received separate scores on recall and recognition of familiar and unfamiliar objects.

The items were chosen with the assumption that all were neutral and of equal familiarity or unfamiliarity for each group of subjects. Common relevance to racial and SES level was, therefore, assumed, i.e., an assumption of the culture balance of the items.

Analysis Procedures

The data were analyzed using the multivariate analysis of covariance procedure. The final design used to analyze the data and test the hypothesis of interest was a two by two by two design with four dependent variables and with age in months as the covariate. Figure I presents the design matrix for the study.

Figure I

Research Design Matrix

INCIDENTAL				INTENTIONAL			
Black		White		Black		White	
Low SES	Middle SES	Low SES	Middle SES	Low SES	Middle SES	Low SES	Middle SES
6	6	6	6	6	6	6	6

The four dependent measures analyzed were recall of familiar objects, recognition of familiar objects, recall of unfamiliar objects, and recognition of unfamiliar objects. All hypotheses were tested using the .05 alpha level with the appropriate degrees of freedom.

RESULTS

The hypothesis tests were conducted by testing the higher order interactions initially. The first hypothesis test was the test for a significant three way interaction between learning type, race, and SES. A multivariate F ratio of .515 was computed and found not to be significant with 4 and 36 degrees of freedom. Therefore, the null hypothesis of no sigificant three way interaction was not rejected.

Finding no significant three way interaction permitted the testing of each of the two way interactions. No significant two way

interaction was found when the socioeconomic status by race interaction was tested. Similarly no significant interaction was found in the test of the interaction between learning type and SES. However, the test of the interaction between race and learning type was found to be significant at the p = .05 level. A multivariate F ratio of 2.71 was found which, with 4 and 36 degrees of freedom, yields a probability level of .045. Therefore, the null hypothesis of no significant interaction between race and learning type was rejected.

An examination of the univariate F ratios on each of the four dependent measures associated with the significant multivariate F ratio reveals that two variables seem to account for the significance. The univaraite F ratio associated with the recognition of unfamiliar objects was found to be 5.26 which was significant at the .03 probability level. The second univariate F ratio found to be significant was that associated with the recall of familiar objects (F = 4.09, p = .050). Table I presents the estimated effects for the cells associated with the recognition of unfamiliar objects.

Table I

Estimated Effects Associated with Recognition of Unfamiliar Objects

	Incidental	Intentional
Black	-3.60	-1.39
White	-1.86	-2.07

An examination of Table I reveals that the white children did substantially better than the black children on the recognition of unfamiliar objects in the incidental learning condition. However, the black children did substantially better than the white youngsters

in the recognition of unfamiliar objects in the intentional learning condition.

Table II presents a summary of the estimated effects associated with the recall of familiar objects.

Table II

Estimated Effects Associated with Recall of Familiar Objects

	Incidental	Intentional
Black	-1.44	- .17
White	-1.73	-1.86

Examination of Table II reveals that black children did somewhat better than the white children in the recall of familiar objects in the incidental learning condition. In the intentional learning condition the black students did substantially better than the white youngsters.

Due to the significant higher order interactions the significance tests of the main effects are somewhat confounded and ought to be interpreted with extreme caution. The main effect test of learning type yielded a multivariate F ratio of 1.86, which was not significant. The multivariate test of the variable of socioeconomic status yielded an F ratio of 2.87 which was significant at the .04 probability level. An examination of the univariate F ratios associated with the multivariate test revealed that a univariate F of 3.98 associated with the recognition of unfamiliar objects was significant. The estimated effects associated with this hypothesis test revealed that lower SES children (-2.76) did substantially poorer than the middle SES children (-1.70) on the recognition of unfamiliar objects.

Finally, the main effect test of race was found to be significant ($F = 3.90$, $p = .01$). An examination of the univariate F ratios associated with the multivariate test revealed that the tests of recall of familiar objects ($F = 8.19$, $p = .006$) and recognition of familiar objects ($F = 3.59$, $p = .06$) contributed to the multivariate significance. Black children (-.80) did substantially better than white children (-1.79) on the recall of familiar objects. Similarly, black children (5.11) did substantially better than white children (4.32) on recognition of familiar objects.

DISCUSSION AND SUMMARY

The experiment sought to verify the existence of incidental learning among preschool age children. The data strongly supports that learning does, in fact, occur in the absence of set for preschool youngsters.

The data further supports the observation that the type of intrinsic set brought to the INC learning situation by children of different racial and socioeconomic groups does influence their learning. Black children performed substantially better than their white counterparts on recall of familiar objects in both the incidental and intentional learning conditions. And while the white children did better on the incidental learning of unfamiliar objects as measured by recognition, their black counterparts did better on such recognition in the intentional learning situation.

While this study should be viewed as suggestive and not conclusive, some interesting questions are raised. Why should the black children perform any differently than white children when objects familiar to both groups were present. One possible explanation is

that the race of the tester (black) interacted with the race of the subjects, thus resulting in differential performance on the tests of incidental and intentional learning. This explanation can and will be examined in subsequent research.

A second possible explanation may be found in the background experiences of black and white youngsters. Could it be that by direct or indirect processes black youngsters are set to focus on things in the environment which are known to them, whereas their white counterparts are, by similar processes, set to focus on those aspects of the immediate environment which are not known to them. With some imagination an experimental procedure could be divised to determine the degree to which this explanation may be viable.

Further research is needed to determine why the expected difference between incidental and intentional learning was not found. Subsequent research is planned which will examine intentional and incidental learning using many and varied tasks.

APPENDIX

Table Showing Content of Instrument Used

Item	Classification	Mode
plants	familiar	object
road signs	familiar	picture
plants	unfamiliar	object
abstracts	unfamiliar	pictures
tables	familiar	object
sea shells	unfamiliar	object
chairs	familiar	object
musical instruments mbira steel drum bongo drum	unfamiliar	object
clocks	familiar	object
fruits coconut cassava banana	unfamiliar	object
numbers 4 2 5	familiar	picuture
miscellaneous desk calendar hand hold punch desk directory	unfamiliar	object
flowers	familiar	picture
miscellaneous stapler tania shadow on film	unfamiliar	object

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